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The diversity of neutrophil inclusion bodies in fulminant sepsis

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3 A 70-year-old man with a normal blood count underwent laparoscopic sigmoid
4 colectomy for localised adenocarcinoma. He had no significant past medical history
5 and was HIV negative. Due to a post-operative anastomotic leak, emergency
6 laparotomy and end-colostomy were performed, but he developed septic shock and
7 required admission to the intensive care unit. *Escherichia coli* was subsequently
8 identified in blood cultures. A full blood count showed: Hb 92 g/l, white cells $16.5 \times 10^9/l$, platelets $64 \times 10^9/l$ and neutrophils $15.5 \times 10^9/l$. Levels of serum procalcitonin
9 (2022.42 ng/ml), C-reactive protein (580 mg/l, normal range (NR) 0–10) and lactate
10 (6.8 mmol/l, NR 0.7–1.8) highlighted the severity of infection. Review of the blood
11 film showed inclusions within neutrophils including Döhle Bodies (top left) and
12 Howell-Jolly-like bodies (top middle and right). Other nuclear changes resembling
13 Barr bodies (bottom left) and less dense fragments associating with, or following
14 separation from, nuclear segments were also visible (bottom right). These features
15 resolved as he improved.
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20 The presence of Döhle bodies (consisting of ribosomes and endoplasmic reticulum)
21 within neutrophils during inflammation and infection is well recognised. In contrast,
22 Howell-Jolly-like bodies, representing non-apoptotic nuclear fragments of neutrophils
23 have been described only in the occasional patient receiving immunosuppressive
24 therapy or granulocyte colony-stimulating factor (G-CSF) or with HIV infection.
25 These intracytoplasmic bodies can mimic infection-related inclusions due to
26 anaplasmosis or ehrlichiosis, but our patient was not at risk of tick-borne diseases
27 and improved despite no therapy for rickettsial disease. The concomitant presence
28 of Howell-Jolly-like bodies and Döhle bodies (similar to that observed with
29 therapeutic G-CSF) seen here may reflect developmental changes in neutrophils due
30 to high levels of endogenous G-CSF in severe sepsis.
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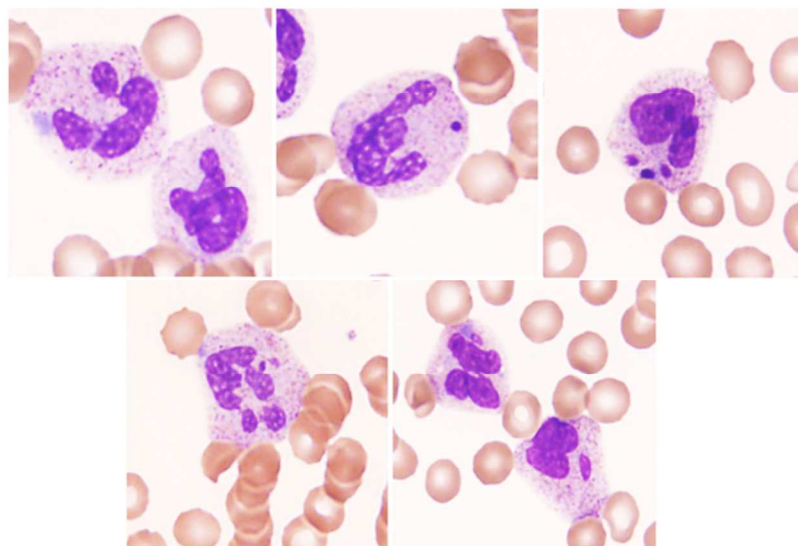
Declarations

The authors have no conflict of interest to declare.

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ST and KB identified the abnormalities in blood film and researched the significance of these. ST wrote the paper.

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